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ABSTRACT

This theme issue of "The Goldfinch" focuses on weather in Iowa and weather lore. The bulletin contains historical articles, fiction, activities, and maps. The table of contents lists: (1) "Wild Rosie's Map"; (2) "History Mystery"; (3) "Iowa's Weather History"; (4) "Weather Wonders"; (6) "Seasonal Jobs"; (7) "Fiction: Winter Courage"; (8) "Stayin' Warm and Keepin' Cool"; (9) "Make a Weather Vane"; (10) "Dear Diary"; (11) "Predicting the Weather"; (12) "Animal Forecasters"; (13) "Wacky Weather Witticisms"; (14) "Fiction: Storm"; (15) "History Makers"; (16) "Iowa Weather Online"; (17) "Answers"; and (18) "The Roost." (EH)

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THE Goldfinch

Iowa History for Young People

Volume 18, Number 2 Winter 1996

ED 417 092

Weather

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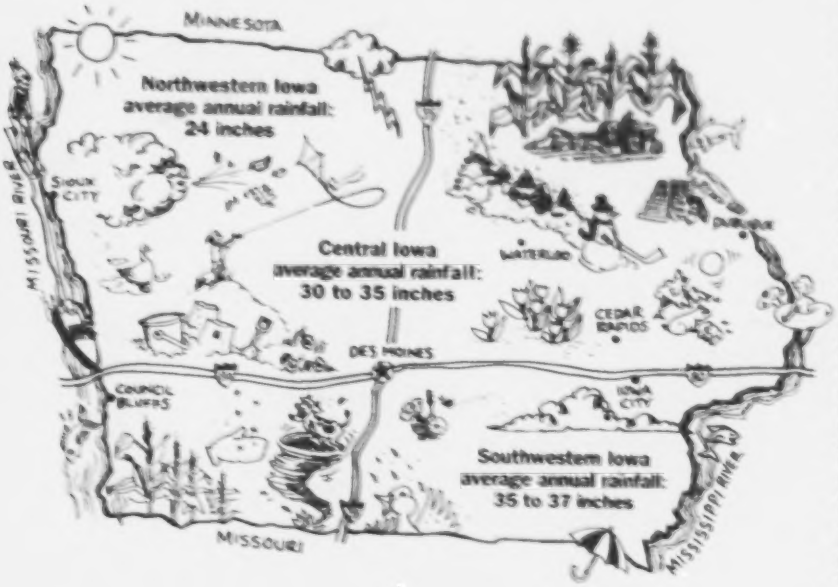
D. GORE

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

Wild Rosie's weather map

Wild Rosie zoomed around the state checking the weather conditions and chatting with State Climatologist Harry Hillaker. She left clues about Iowa weather on the map below. To learn how weather varies across Iowa, study the numbers and pictures on the map and answer the questions. Answers on page 30.



1. Which part of the state is the driest?
2. Which part of the state receives the most rain?
3. Which part of the state receives the most snow?
4. Climate wise, which area of the state is best for crops?
5. Would you expect temperatures to be cooler or warmer along the Minnesota border? Why?
6. Would you expect temperatures to be cooler or warmer along the Missouri border? Why?

THE Goldfinch

Volume 18, Number 2 Winter 1996

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History mystery

by Julie Seidler

ROSIE: Hey Goldie! Look at those downspouts. They all come out the same place. And what's that tank on the side of the house for?

GOLDIE: I think it's a rain barrel. But I wonder where all the rainwater goes once it's collected from the roof? That rain barrel is way too little to hold all that water. We know Rosie doesn't know the answer. Where do YOU think the rainwater goes?

ANSWER: The rainwater from the roof drains into a big underground tank called a cistern (SIS-turn). Before indoor plumbing, Americans used rainwater as a water source. When people wanted a drink of water or needed to wash dishes, clothes, and even their hair, they carried it into the house in buckets or used indoor pumps. Underground storage kept the water at a constant cool temperature. Rainwater used to be much softer than well water which contains minerals from the soil. Today, rainwater often contains harsh chemicals from air pollution.

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A weather dictionary

Atmosphere – air that surrounds the earth.
Climate – usual weather conditions of a place over time.
Climatologist – person who studies climate.
Front – boundary between large air masses.
Meteorologist – person who studies weather, climate, and the earth's atmosphere.
Precipitation – moisture that falls from the sky; rain and snow.
Weather – conditions outside at any particular time and place.

by Amy Ruth

Iowa's weather history

It's hard to believe, but Iowa was once a tropical climate, and during the Ice Age it was like a giant ice cube.

Twelve thousand years ago, when humans first came into the area, Iowa's current climate began to emerge slowly. The last glacier melted. The atmosphere warmed. Rains eased and prairies grew.

The extreme weather conditions Iowans know today – cold winters and hot summers – are a result of the state's geography. Our location in the middle of the continent, and nearly midway between the Equator and the Arctic, determines our climate.

Weather and the first Iowans

The Mesquakie Indians lived throughout the Midwest long before European-American settlers moved here in the 1830s.

"Their lives depended on knowing the weather," Johnathan Buffalo, Mesquakie tribal historian, told *The Goldfinch*. "It would determine when they would plant, when they would harvest and when they would go out and pick nuts and berries and when to hunt certain animals."

Sometimes the Mesquakie wondered if bad weather was a form of punishment. "The coldest winter this tribe has ever felt was around 1843 and that was when we sold our tribal lands," Buffalo said. "So we wondered if we did the right thing by selling our land."

European-American explorers and pioneers who traveled to Iowa from the East were in for a few surprises, State Climatologist Harry Hillaker told *The Goldfinch*.

Freezing cold winter temperatures shocked many new settlers. Thunder and lightning storms also were more severe and frequent in Iowa.

Researching the weather

To learn more about weather from the early and mid-1800s, historians must rely on clues from the natural world.

Tree ring measurements tell us, for example, that in the 1820s and 1830s Iowa had a very dry climate. Around the same time, fur trappers in the Plains referred to the area as the "great American desert" because it was so dry.

Historical documents from the time period also give weather details. In the 1820s and 1830s, surveyors traveled the region looking for sites for military posts. Many kept journals that tell us about the area's climate.

Weather patterns

Iowa has experienced wet and dry periods that last for several decades at a time, but what meteorologists and climatologists don't know yet is how to predict when and why changes will occur in long-term weather patterns.

The 1850s and 1860s brought some of the state's wettest weather. Then came dry periods and more wet periods. Most recently, the last 35 years have been quite wet across the state which has caused much flooding.

This year, the *Des Moines Register* reported that early frosts in Iowa have been increasing over the last 20 years.

For Iowa farmers, this means a greater risk to crops.

Temperature

The northern part of the state, along the Minnesota border, is generally seven to eight degrees cooler than southern Iowa, along the Missouri border.

Iowans experienced some of the coldest winters in the 1880s when temperatures plummeted and unexpected early storms blanketed the state. In 1881, some parts of western Iowa still reported snow on the ground as late as May, Hillaker said.

Cecelia Gullixson, whose parents were farmers in Humboldt County in the 1880s, remembered that during one winter storm, snow drifted so much it nearly filled the family's barn.

The Dust Bowl

In the 1930s, the spring and summer weather was hot, dry, and dusty in Iowa and much of the country. Year after year, droughts plagued farmers and crops. Some town officials in Iowa hired Mesquakie Indians to come and perform rain dances.

"The old rain dance routine is a false idea among non-Indians," Buffalo said. "There is no rain dance. But some got desperate enough to maybe believe that Indians just might be able to make it rain. A group of Mesquakie would go [to the town] and dance any dance. As long as they were getting paid, they'd do it."

Iowa weather today

Iowans have long depended on favorable weather conditions to help crops grow. Too much rain, a sudden cold spell, or other drastic weather changes can destroy an entire year's harvest.

Today, weather watchers use sophisticated instruments to check conditions many times a day. Regular crop reports and weather forecasts help Iowans decide when to plant and harvest, when to go on vacation, and when to do many other activities. The weather hasn't changed much in Iowa over the last two or three hundred years, but Iowans are more determined than ever to understand how it works.

– with Johnathan Buffalo and Harry Hillaker

Check us out!

In this issue we'll take you on a tour of Iowa's weather – through blinding blizzards, sultry summers, and everything in between. You'll learn how Iowans have coped with the state's extreme climate, and how they have predicted the weather. Read about how weather has affected work in Iowa history. Adventure through an actual kid's diary from the 1890s. Get into two fiction stories and let tons of wacky weather jokes tickle your funny bone. Then buckle down and make your own forecasting instrument – a weather vane – to help you predict the weather in your own backyard!

by Millie K. Frese
art by M. Moye-Rowley

Weather wonders

The Goldfinch checked out old newspapers, diaries, weather records, and other historical documents for the top five weather wonders in Iowa's history. The following reports show off Iowa's climate.

5

January 1936 arrived with hints of an early spring. But on January 18, mild weather gave way to sub-zero temperatures. In northwest Iowa, overnight temperatures remained below zero for 35 days straight. Blizzards dropped record amounts of snow. The average snowfall for January 1936 was 19.4 inches – three times the normal snowfall. Altogether, 42.9 inches of snow fell that winter.

The cold and snow froze Iowa to a standstill. Icy winds whipped snow into 15-foot drifts. It's estimated that more than half of Iowa's 215,000 farms were isolated for up to seven weeks.

Bitter cold that year gave way to a summer marked by blistering heat. Drought and searing temperatures baked the earth and scorched crops. Across the state, maximum recorded temperatures reached 100 degrees or higher, including 117 degrees at Atlantic and Logan on July 25. This temperature remains the state's all-time recorded high.

In 1936, the worst winter on record was followed by the worst summer on record. Weather watchers that year predicted it would be remembered for generations to come.

4

Speaking of blizzards: when a raging snow storm swept across the Dakotas and Iowa on March 14, 1870, O.E. Bates, the editor of the *Estherville Northern Vindicator*, called the phenomenon a blizzard. Bates is generally credited with first using the word as we know it today, but others have claimed to have coined the term.

In 1866, a Mrs. Wells of Spencer, Iowa is reported to have said, "My this is a regular old man blizzard of a storm," as she was looking out her window on a winter's day.

The word "blizzard" originally meant "a rifle shot" and "a violent blow." These meanings fell from common use long ago.

Today, meteorologists classify blizzards as violent winter storms that combine falling or blowing snow, winds shrieking at 35 miles per hour or stronger, and temperatures at 20 degrees Fahrenheit or lower for an extended time.

3 Imagine sitting at your desk at school, paying close attention to the lesson when your desk begins to sway. The floor suddenly shakes. The entire school building trembles.

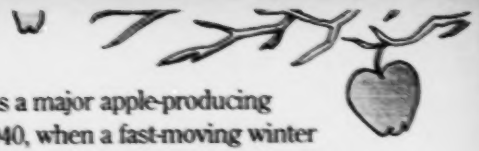
Earthquake!

The teachers calmly guide students out of the building.

Is this California?

No – it's Council Bluffs, Iowa. The date: November 15, 1877. The same quake caused 45 seconds of terror in Sioux City. Buildings rocked, windows rattled, and school supplies tumbled off shelves.

Iowa's first recorded earthquake shook Burlington on January 4, 1843. Several buildings were affected by the shock. Geologists have chronicled many other quakes and minor tremors throughout Iowa in the 153 years since the first-recorded tremor. One thing they all have in common: No lives have been lost. The heavy glacial drift that blankets Iowa absorbs the shock, keeping property damage to a minimum. Today, Iowa's geological faults are virtually inactive.



2 Iowa lost its distinction as a major apple-producing state on November 11, 1940, when a fast-moving winter storm caught Iowa off guard. Until then, it had been a mild autumn, with temperatures warmer than normal. Conditions changed dramatically when temperatures plummeted from 55 degrees to 17 degrees in a few hours. Winds blew more than 50 miles per hour. Seventeen inches of snow drifted across northwest Iowa.

The sudden drop in temperature devastated Iowa's orchards. Apple trees normally are dormant in winter and can withstand subfreezing temperatures. But because of the mild autumn, the sap had not yet settled. The trees weren't ready for the shocking cold and fierce winds that uprooted telephone polls.

The season before the blizzard, commercial orchards in twelve Iowa counties harvested 485,000 **bushels** of apples. Production dropped by 85 percent to 74,000 bushels in 1941. Many growers did not replant, since apple trees take four to eight years to produce.

1 As important as predicting weather is in Iowa, it's no wonder kids are getting involved.

Thanks to a weather station given to Lucas Elementary School in Iowa City by KWWL-TV in Waterloo, students gather detailed weather data daily. And, when severe weather approaches, they are among the first to know.

Student meteorologists at Lucas track temperature, wind speed and direction, barometric pressure, light intensity, and humidity.

Schools in Cedar Rapids, Dubuque, Waterloo and across the country have similar technology and can access data from a nationwide network.

6 bushel – a unit of measurement for grains, fruits, and vegetables

Seasonal jobs

Photos this page from SHSI (Iowa City)/Joan Liffring Zug Collection

Migrant workers follow the harvest from place to place. These Mexican workers harvest tomatoes in Muscatine, around 1960.

Throughout Iowa history, people have asked themselves, "I wonder what the weather will be like tomorrow?"

People need to know if they should take an umbrella to work, wear rain or snow boots, and whether or not it will be warm enough for shorts. But for Iowans who work outside, the weather can make the difference between getting their jobs done and not working at all.

Some jobs in Iowa are seasonal, which means they are performed at certain times of the year. You do seasonal work if you shovel snow in winter or mow the lawn in spring. Iowa young people often detassel corn in the hot summer sun to earn extra money.

Migrant workers

Migrant (MY-grunt) workers in Iowa and across the nation move from place to place, following the harvests they are paid to gather. In Iowa, migrant workers have harvested sugar beets, potatoes, asparagus, tomatoes, cucumbers, and other crops. Unfavorable weather conditions delay work. This is bad for migrant workers – when they don't work, they don't get paid.

In the 1860s, Iowa was one of the country's leading producers of wheat. In July and August, farmers hired extra workers who traveled to Iowa specifically to work as harvest hands. Sometimes newspapers published news of the workers' arrival. The July 15, 1869 *Daily Davenport Democrat* announced: "Some two hundred or more harvest hands were congregated along Front street today, waiting

for bids from farmers."

At the turn of the century, 15 canning companies in Iowa provided seasonal jobs. The Atlantic Canning Company in Atlantic hired extra workers to prepare and package peas, corn, beans, and pumpkins when they were ripe. Canning often meant long work hours, as employees kept up with freshly harvested crops.

Amusement parks and more

Amusement parks are seasonal businesses that promise fun for kids, but lots of work for park owners and employees. In the past, family-owned amusement parks dotted Iowa, and kids could ride a carousel in Burlington, Muscatine, Iowa Falls, Cedar Rapids, and Des Moines. Today, one of the few remaining family-owned amusement parks operates in Iowa City.

Hannah Drollinger, 12, and her sister Meagan, 8, help their parents sell snow cones and cotton candy from April to October each year. The family works every day, unless it rains. Hannah says business is best when it's sunny and the temperature is in the 70s. "If it's too hot, everyone is at the swimming pool, and if it's cloudy, they stay home," she told *The Goldfinch*.

Some businesses operate year-round, but change the kind of work they do depending on the season. Construction companies often spend summer building the outside of buildings, and then finish the inside in winter. Restaurants scoop more chocolate ice cream into cones in July and pour more hot chocolate into mugs in January.

Farming with the seasons

Farmers also change the work they do, according to the season and the weather. Planting or harvesting crops may be delayed if it is too rainy for tractors to work in the fields. Unusual weather patterns – an especially cool spring, or a very dry mid-summer – can affect the time it takes crops to grow.

In the 1800s, farmers might spend the winter trapping animals to sell for extra income. Cecelia Gullixson of Humboldt County remembered that in the 1870s, her father trapped muskrats, minks, weasels, and foxes. One winter he trapped 300 pelts which was enough to buy a $6 pair of boots. Today, farmers spend cold months caring for animals, repairing machinery, and doing paperwork.

Charles Clarke and daughter, Lilla, pose in an Iowa beeyard, 1899.

Some agricultural workers are busier at certain times of the year. Christmas tree farmers are busiest in December. Beekeepers, who have long harvested honey in Iowa, are busiest from May until late fall. Carol Fassbinder, 15, of Elgin, helps her family with 1,500 colonies of bees.

"Summertime is hectic," Carol told *The Goldfinch*. That's when she has to go to the bee

Men in the Amana Colonies cut ice in a nearby lake, 1930s.

barn, extract honey, and put it into tanks. But she also feeds the bees buckets of corn syrup in the fall, covers the hives with fiberglass blankets in the winter, and worries about the weather year round.

"Bees' honey production is related to the weather," said Carol. "Hot, dry years seem to be best for basswood, clover, and alfalfa." Bees drink the nectar of these plants to produce honey. They don't like to work when it's cold, windy, or rainy.

Working rain or shine

In Iowa's past, some year-round occupations were made more difficult by bad weather. Modern inventions have eased some of these problems. Before paved roads, workers who depended on a horse and buggy or car might be in trouble in rainy or icy weather. When doctors used to visit patients at their homes, they had difficulty reaching them if the roads were slippery or muddy.

Even morticians had a problem if roads were impassable. When Iowa Citians covered their streets with bricks, one of the first streets they paved ran to the cemetery, so bodies could be more easily transported for burial.

Out of business

Technology has made some seasonal businesses extinct. Before refrigeration, ice harvesting was an important industry. Workers cut blocks of ice from lakes and rivers in the winter and stored them in buildings insulated with sawdust for use in warmer months. An ice vendor sold ice blocks and shaved ice, making door-to-door deliveries. Modern refrigeration ended the ice business in the 1930s.

Technology brought air conditioning and central heating to cool and heat our homes and businesses. Some farmers, who once sweated while combining their soybeans, now ride in the comfort of air-conditioned tractor cabs.

But despite technological advances, the weather has the last word. During the flood of 1993, hundreds of Iowa businesses closed temporarily. Blizzards still make roads impassable, keeping workers at home. Ice and wind storms snap telephone poles and pull down electrical wires, forcing stores and offices to close. Tornadoes can tear apart a farm in minutes. Though humans have come a long way in coping with the changeable Iowa weather, Mother Nature is still in charge.

by Child Christopher Elliott

Winter courage

The winter of 1880-81 was one of the most severe in Iowa history. Blizzards blew beginning in October and did not let up until March. Iowans, like the fictional family in the following story, endured hardships caused by dwindling supplies of food and fuel.

"Jim, please feed the fire," Mama said, shivering as she patched a broken window in the front room with a threadbare rug and old newspapers.

My older brother obeyed, fumbling for a twisted band of hay from the shrinking pile as I hopped in place to keep warm.

Art by Mary Moye-Rowley

The dry prairie grass snapped and popped as it caught fire. A loud *BANG!* startled us when the front door flew open. Two snow-covered figures blew in on a gust of icy wind.

Papa brushed the snow from his beard with a mittened hand. His breath hung frozen in the air. Clem, our hired man, threw all his weight against the door to push it shut and secure the heavy latch.

"The thermometer's reaching just above zero. Cold enough to freeze the horns off a Siberian reindeer," Clem chattered through dry, cracked lips.

"It's the fifth big storm we've had this season," Papa declared. He pulled off his mittens, wincing at his reddened hands. We knew he was worried about the animals – otherwise he and Clem would not have braved the cold winds and high snow drifts to check on them.

Mama helped unwind the hand-knit scarf wrapped around his neck. "How are the animals?" she asked.

"Fine – so far," Papa said, moving closer to the fire. "They're safe in the barn. We fed them extra well and sealed the barn up as tight as we could. Still, I don't envy them tonight. It's bad out there and getting worse."

Suddenly I felt cold all over. My thoughts turned to the palomino pony Papa bought last fall. Papa let me name her, and in the spring he promised to teach me how to ride.

"What about Brandy?" I cried. "Will she be all right?"

Papa smiled and put his strong hand on my shoulder.

"She'll be fine, Susan," he said. "Animals have a much easier time keeping warm than people do."

I nodded, but couldn't help worrying. I knew that animals could freeze to death in the elements. I was glad ours were

snug in the barn.

"I'll get supper," Mama said cheerfully. She scooped cornmeal into a bowl, frowning at the small supply that remained in the sack.

Tonight, to conserve fuel, she cooked corn cakes and potatoes over the fire instead of on the massive iron stove in the kitchen. No one knew how long this blizzard would last and not one of us wanted to run out of food or fuel before it ended. In between storms, Papa could walk the two miles to the Clancey farmstead and trade for necessary supplies. Last month he had borrowed flour and now we were running low on cornmeal. We knew the Clanceys were burning their corn and oats; when the storm lifted, Papa would take them some of our twisted prairie grass. But while the storm raged, the only safe place for human and beast was inside.

When the wind howled, we could feel the foundation of our frame house sighing below us, but we knew we were safe. Papa had built our home himself.

After supper, we all stayed close to the fire twisting the hay that would keep the flames going. Even though I was only 9, I could twist almost as fast as Jim. Mama recorded details of the storm in her diary, then helped us. Next to her, Papa smoked his pipe and stared into the fire.

Clem quietly strummed Papa's guitar. He sang softly:

"Winter winds keep on blowin'
Darkness falls down below
Travelin's hard when it's snowin'
How shall I find my way home?"

We all yearned for spring. Closing my eyes, I could almost feel the fresh, green grass under my bare feet and the soft summer breeze on my face. After being cooped up all winter, I couldn't wait for quiet evenings outside, looking up at the stars.

"Tell us a story, Papa," I begged. "It will help pass the time."

Jim's eyes rose from his work in anticipation. Papa told the best stories.

A familiar gleam lit Papa's eyes. "A story? Hmm . . . let me see. A story for a cold winter's night. Did I ever tell you about Jacob O'Shannon?"

Jim and I shook our heads. "No," we cried out together.

"All right, then," Papa decided. "Jacob O'Shannon it is."

He began:

"This one goes back a ways. Back before the Civil War, even before Iowa joined the Union. The O'Shannons were a family of Irish immigrants who came over here to start fresh. Joseph O'Shannon bought a tract of land from the government and moved west with his wife, Elizabeth, their son Jacob, and a beagle named Blue.

They worked hard to build their homestead. Then, during their fourth winter in America, Joseph fell sick and died from fever. That winter was cold and harsh, like this one. And now it was twelve-year-old Jacob's job to hunt for food.

One morning, Jacob and Blue tracked a rabbit through the woods across a fresh blanket of snow. Quietly, they crept up behind the rabbit as it sat motionless near a gigantic fallen tree. Jacob aimed carefully and fired. His shot hit its mark, but before Jacob and Blue could retrieve the rabbit, a half-starved bear charged at them from his den within that hollow tree. One swift, powerful blow left Jacob unconscious. Blue barked furi-

ously, determined to protect his master. The bear, still half asleep from hibernating, lumbered away.

Hours passed. Jacob awoke to find Blue licking a deep gash on his cheek. He was numb and in shock, but struggled to his feet.

I can't fall asleep, Jacob told himself. If I do, I will surely freeze to death.

He walked a few steps, then collapsed. Blue paced around Jacob, nudging him until he groggily got on his hands and knees and stumbled forward. Blue lifted the dead rabbit between his teeth and followed his young master a few feet.

"I can't do it," Jacob whispered. "Forgive me, Mother. I'm so tired..."

Just then he saw a man standing before him, beckoning him to follow.

"Jacob O'Shannon, you must come with me," the stranger commanded.

"Help me, please," Jacob cried. "I'm hurt."

The man set off in the direction of the cabin. Somehow, Jacob found the strength to stumble after him. Each time Jacob paused to rest, the man urged him on. Jacob followed the stranger through the darkness toward home.

Finally, Jacob saw lamplight spilling from the cabin window. The stranger paused in front of the window.

"Who are you?" Jacob whispered. The man turned around, and in the glow from the tiny window, Jacob saw his face and gasped in surprise.

"I'm proud of you, son," the stranger said.

Father! Jacob was stunned. There was so much he wanted to say, but before he could find the words, the mysterious figure vanished. Blue's joyful barking summoned Jacob's mother to the door. She tended his wounds and in a few weeks, Jacob was well again. During his recovery, spring bloomed around the farmstead. They had survived the winter."

"That was a good story," Jim said when Papa finished. I agreed but shivered at the thought of Joseph O'Shannon's ghost. Somehow, though, the story made me feel better. I knew that no matter how bad the winter, there was always the promise of spring.

Art by Mary Moye-Rowle

by Amy Nash

Stayin' warm and keepin' cool

Historians look to old newspapers, magazines, catalogs, and photographs to tell them about the past. *The Goldfinch* checked out these items and more to learn how Iowans have beat the heat and tricked Old Man Winter. Here's what we found.

Taking a dip

SHSI (Iowa City)

Like many Iowa families, the Hoffmans, pictured above, beat the heat in a nearby lake or swimming hole. When community swimming pools became more common after 1900, Iowans went there to cool off. Early swimsuits resembled a dress or pantsuit that covered much of the swimmer's body. By the 1940s, when sun tanning became cool, swimsuits began to lose their bulkiness.

Clockwise: 1890s women's bathing cap; 1890s girl's bathing suit; early 1900s men's bathing suit.

Toasty toes

In 1894, the Montgomery Ward fall and winter catalog sold almost 20 different styles of full-length cold-weather socks, leggings, and stockings. Most styles also came in children's sizes. The "Men's Extra-long All Wool Hose," pictured here, was 18 inches long and made especially for outdoor activities such as hunting. This style came in scarlet, black, or grey, and sold for 70 cents a pair.

Your biggest fan

Before electricity came to Iowa's homes and businesses, Iowans used hand-held fans to generate a breeze and keep cool. Fans like the ones below sold for about 45 cents in the 1897 Sears, Roebuck catalog. The electric fan was invented in 1882 but many rural Iowa homes did not have electricity until the 1940s.

Cozy bedfellows?

While snow, sleet, and freezing temperatures raged outside, Iowans stayed toasty inside with a little help from hot water bottles, potatoes, and rocks. These items were popular bedfellows when Iowans still heated their homes with wood- and coal-burning stoves and fireplaces. Rubber hot water bottles were filled with hot water and slipped between icy cold sheets to warm the bed. Hot potatoes or stones, heated on the stove, warmed cold feet in bed and on sleigh rides to school or town. The two-quart hot water bottle pictured to the left sold for 75 cents in the 1894-95 Montgomery Ward fall and winter catalog.

Mesquakie attire

Before they adopted modern forms of dress, the Mesquakie wore animal skins that kept them warm or cool, depending on the season. Mesquakie tribal historian Johnathan Buffalo told *The Goldfinch* that in the summer tribe members wore deer skins, like the one pictured here. In the winter, the Mesquakie dressed in clothes made from heavier skins, such as elk and buffalo.

SHSI (Iowa City)

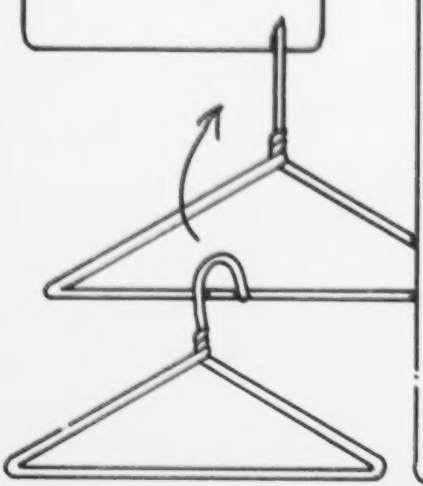
Make a weather vane

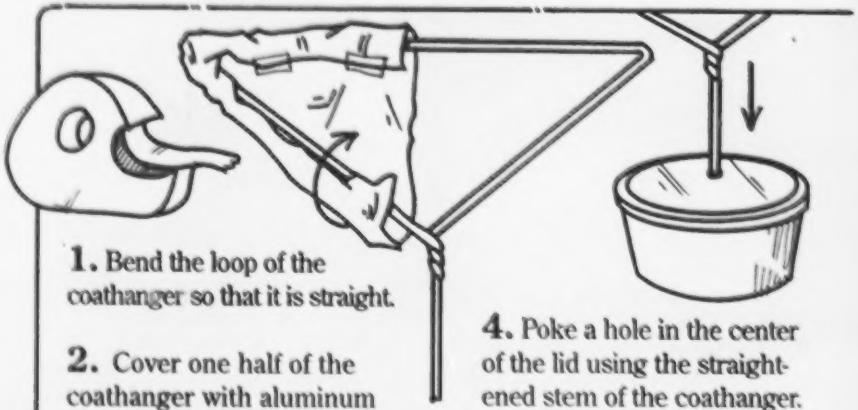
by Lin Ly

Most of us like surprises. But when it comes to Iowa weather, surprises are not always fun. Shield yourself from unexpected changes in the weather with a weather vane. This instrument tells the direction of the wind. When you know the wind direction, you can make some weather predictions of your own. Follow these easy steps to make your own weather vane, and then wow your family and friends with your forecasting power!

You will need:

wire coathanger
aluminum foil
pint-size plastic container and lid
sand
tape
scissors
marker





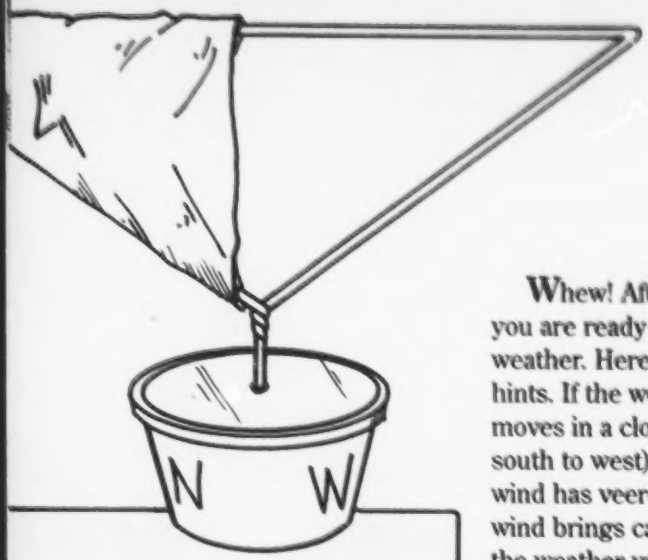
1. Bend the loop of the coathanger so that it is straight.

2. Cover one half of the coathanger with aluminum foil. Cut the foil an inch wider than the wire outline so that you can fold the foil over the edges and tape it.

3. Fill the plastic container completely with sand and put on the lid.

4. Poke a hole in the center of the lid using the straightened stem of the coathanger.

5. Push the coathanger through the hole until the stem touches the bottom of the container. The weather vane should turn freely. If it does not, check to see if the hole in the lid is big enough.

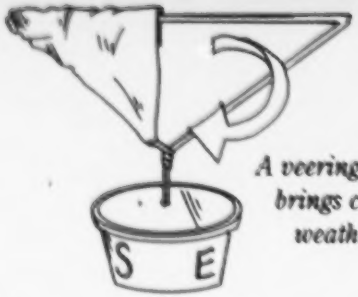


6. With a marker mark the locations of north, south, east, and west on the side of the container. A compass can tell you the locations of these directions or ask someone who knows.

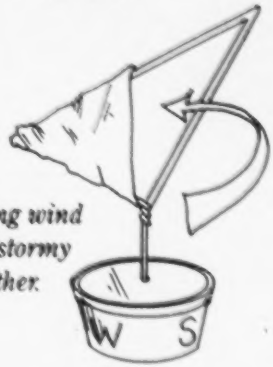
7. Place the weather vane in an open area where it can catch the wind (the higher the spot the better).

8. The uncovered half of the weather vane will point in the direction that the wind is coming from.

Art by M. Moye-Rowley



A veering wind brings calm weather.



A backing wind brings stormy weather.

Whew! After all that work, you are ready to predict the weather. Here are some helpful hints. If the weather vane moves in a clockwise (east to south to west) direction, the wind has veered. A veering wind brings calm weather. If the weather vane moves in a counterclockwise (west to south to east) direction, it signals a backing wind. A backing wind brings – yep, you guessed it – stormy weather. Specific wind directions also signal certain weather conditions. A strong south or east wind will bring rain within 36 hours. In winter, northeast winds bring heavy snow.

Rain or shine, sleet or snow, you will be one person the weather won't surprise.

This activity was adapted from Steven Caney's Kids' America.

Dear Diary . . .

Fifteen-year-old Mary Eleanor Armstrong lived in rural Jones County in the 1890s. Her family farmed for a living. Like all rural families in Iowa, the Armstrongs paid close attention to the weather. During the Spring of 1892, Mary made several entries about rain. This comes as no surprise as May 1892 still ranks as the wettest May recorded in Iowa history. Today, Mary's diary shows us how the weather affected the Armstrong household. Check out her entries, then be a diary detective on the next page!

October 29, 1891

Today is the day for our company to come. I am **on the fence** now to know what dress I'll wear, my calico or flannel. Goodness knows it is cold enough to wear flannel.

November 15, 1891

Raining! Rain! Rain! Oh! I would like to see nice weather again! Dote [a girlfriend] is coming up to stay all night with me next Sat. night. Won't I be glad? Week from tomorrow I will be "just sweet 16."

November 17, 1891

Cold. Mr. Bailey butchered a cow. I made mittens and put lining in 2 pairs of stockings.

December 6, 1891

Snowed all day, tonight it stopped. I hope it will be good sleighing.

January 11, 1892

Went to school. (Snowed today.)

January 22, 1892

Went to school. The boys hauled ice.

March 21, 1892

Washed. Ben and John were going to go to a theater but it snowed and blowed so bad they didn't go.

April 20, 1892

Showery and cool. I planted some pansys & cypress. Gene plowed the garden and Pa planted some potatoes.

May 9, 1892

Staid at home. It rained all day.

May 21, 1892

Had a frost last night. I baked cookies and a cake.

June 1, 1892

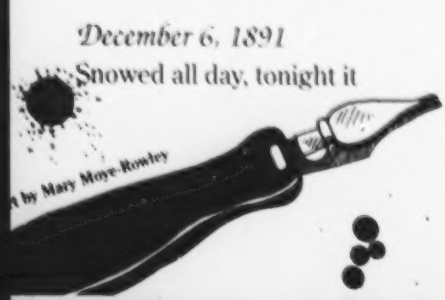
I never saw so much rain. Everyone is discouraged about the crops. Pa has kept up pretty well until this last week or two. I have not kept an account of the rains in this book. I wish I had now. The rain has leaked in the parlor and the boys' room.

June 17, 1892

Staid at home. Roads were too muddy to go to Englishes [neighbors].

June 23, 1892

We had a regular flood last night. It washed out about 700 feet of Railroad this side of Morely. Jim Joslin's barn was struck by lightning last night & burned up. The Wapsie is way up. It is running over the railings to the Dublin bridge. John, Gene, and the McCracken boys went down to the R.R. to see where it washed up. They say the fences & bridges are a total wreck.



by Mary Moye-Rowley

on the fence = undecided

Be a diary detective

Mary Eleanor Armstrong

Mary kept a diary from the time she was fifteen years old in 1891 until 1961, seven years before she died. Why did Mary think it was so important to record weather happenings in her diary? How did weather affect her life? The answers are in the diary entries you just read! Use what you've learned to answer the questions below.

1. List the days Mary and other family members stayed home because of the weather. What was the weather like on each of those days?

2. Name three things in Mary's life that were affected by the weather.

3. What weather condition did Mary mention most often in her diary?

4. Why did Mary and family members choose April 20 to plant flowers and vegetables?

5. Name three things that were damaged or destroyed by bad weather and recorded in Mary's diary.

6. Why do you think Mary wished she had recorded rainfall more precisely in her diary?

7. Name three seasonal activities Mary mentioned in her diary.

Answers on page 30.

Predicting the weather

by Bridgett Williams-Searle

Iowans in history have looked for better ways to predict the weather. Today, we continue their search for answers to basic questions about the weather.

Iowa's Native American and early European-American inhabitants used myths and traditional stories to help them predict the weather.

"It's not a science, it's what they call folklore," said Johnathan Buffalo, tribal historian for the Mesquakie tribe in Tama, Iowa. "The older people can look into the woods and can tell [the weather] by the sounds it makes. They recognized certain formations of clouds and predicted the weather, just like today's forecasters do."

Iowans also read available weather guides and watched stars, animals, and plants to pick up clues. Parents told children that upturned leaves on trees meant that a storm was on its way. Thick skins on onions was a sure sign of a hard winter. Farmers watched the phases of the moon and the position of the stars to determine the ideal time for planting and harvest.

Many Iowa farmers turned to annual almanacs for weather information. Almanacs contained jokes, stories, planting advice, astrological information, recipes, and most important, weather predictions for each day in the coming year. These "forecasts" were issued nearly a year in advance, and were often no better than guesses. Still, many families enjoyed reading almanacs and would compare their own observations with almanac predictions.

Theodore Parvin of Davenport, for example, was so interested in tracking weather patterns that beginning in the late 1830s, he observed and recorded daily weather conditions for almost 40 years. He is credited with starting the earliest continuous climate record in Iowa. Over many years, families could look back at this old information and make better guesses about what each month might bring.

SHSI (Iowa City)/William Larrabee Collection

Augusta Larrabee of the Iowa Weather Service.

In 1875, Gustavus Hinrichs, a teacher at the State University of Iowa (now the University of Iowa in Iowa City), organized a volunteer network to gather weather news from across the state.

His youngest volunteer was Augusta Larrabee, daughter of Iowa governor William Larrabee. Augusta was only 14 when she began making weather reports for Fayette County in northeastern Iowa. Hinrich's organization, known as the Iowa Weather Service, became Iowa's first statewide weather reporting agency. Today, thanks to Parvin, Hinrichs, and their weather watchers, Iowa has the longest-running statewide weather service in the country.

Local information was useful for farmers and others in Iowa's small towns, but they eventually needed to know weather news from other places. To make better decisions about where to sell their products and when to travel, they needed regional and national weather information.

In 1870, the Meteorological Division of the U.S. Army Signal Service began issuing routine weather forecasts. Just a few years later, daily weather reports and summaries of weather and crop conditions were issued. As mail service to rural areas improved, these weather bulletins became a valuable resource for Iowa farmers.

Twentieth-century improvements in weather forecasting have been linked to developments in communication and military technology. In 1917, a daring aviator flew the first weather plane into a storm to gather information on lightning. Families clustered around their new radios to hear the most popular program on WOI Radio in 1922 – the weather forecast! Radar, now recognized as the meteorologist's best friend, was originally used during World War II as a means of tracking aircraft after dark and during cloudy conditions during daylight hours. In 1946, when the war ended, the U.S. Army gave the National Weather Service 25 airplane radar systems for weather forecasting. Early television stations in the 1950s attempted to attract audiences by developing more accurate weather predictions than competing radio and television stations.

The newest advance in weather prediction, Doppler Radar, is even more sensitive than older types of radar. It allows forecasters to "see" into a storm, measuring wind movements within a storm. Television stations across the country use Doppler Radar to spot tornadoes and hurricanes.

Today, the National Weather Service still has about 200 volunteer weather observers across Iowa. These observers continue the historical record of weather and climate observations begun well over 100 years ago. Because these observers still use much of the same observational practices as they did a century ago, it is possible to detect and describe variations in our climate over time.

SHSI (Iowa City)/Rickels Collection

Beginning in the early 1900s Iowans listened to the radio for weather reports. Robert and Lenore Rickels of Atkins listen to the radio in 1927.

By John Williams-Searle

Animal forecasters

Are these animals really weatherwise?

Before television, radio, and radar, Americans relied on animals to forecast the weather. Farmers particularly paid close attention to the habits of livestock, wildlife, pets, and insects. People believed these creatures could tell them when to expect rain, snow, or a change in the seasons.

Weatherlore: fact or fiction?

In the 1800s, Iowa farmers thought that a lot of dark-colored caterpillars meant that they could expect a hard winter. Other hard winter signs included bushy squirrels' tails; heavy coats on horses, sheep, mules, and dogs; screech owls sounding like women crying; and crows gathering together. Thick fur on the bottom of a rabbit's foot was also believed to be a sign of a hard winter.

This weatherlore was passed down from generation to generation and there was probably some accuracy in these seasonal predictions. If they didn't work at least part of the time, people would have stopped using them.

Rain, rain, and more rain

In addition to forecasting the seasons, people also observed animals to predict daily and weekly weather patterns – especially rain. Some said that if dogs or cats ate grass, it would soon rain. Others listened for wild pigeons cooing, which they thought was a sure sign of rain. Croaking frogs indicated the approach of a storm. Some people even looked to see if spiders were taking in their webs. People believed that "when spiders take in their net, the weather will soon be wet."

Animal forecasting is often accurate because animals are more aware than humans of small changes in their physical surroundings. Farmers who observed swallows and bats flying close to the ground knew it would soon rain because swallows and bats have sensitive ears that are affected by the

sudden changes in air pressure that come before a storm. Farmers believed that "if swallows fly high, clear blue sky. If swallows fly low, rain you will soon know."

Farmers also thought that their cows predicted rain, saying that "a cow with its tail to the west, makes weather the best. A cow with its tail to the east, makes weather the least." This saying also was somewhat accurate because animals graze with their tails to the wind, and an east wind often brings rain.

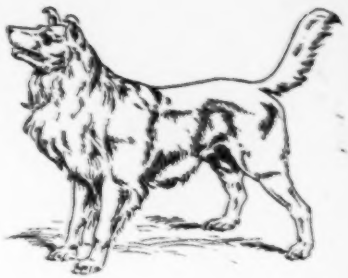
Finally, the old saying "when ants build high, rain will fall from the sky" also contains a grain of truth. About two hours before it rains, some species of ants build dams around their tiny anthills to prevent flooding.

They brought it with them

Most American weatherlore originated in Europe. The many European immigrants who settled in Iowa in the middle and late 1800s brought with them their own weatherlore. Much of it did not apply to Iowa's climate. The English believed that a cat washing its face over its ear was a sure sign that the weather would be clear. A Scottish tradition said that if a cat sneezed, rain was sure to follow. Although these predictions had no scientific basis, they were often accurate in the British Isles simply because it rains frequently there.

Weatherlore today

Although modern technologies have replaced animal forecasters, many people still repeat old animal weather sayings. The phrase "it's raining cats and dogs" probably springs from old weatherlore. Animals are still more sensitive to weather than humans are, so there is no reason to doubt that some animal forecasting actually works. The next time you see a dog or cat eating grass, a cow chowing down with its tail to the east, or swallows flying close to the ground, observe closely. Is rain on the way or is this merely another animal forecasting myth? To find out, keep watching the skies!



Wacky weather witticisms

Iowa's varied and extreme weather conditions inspire jokes, riddles, and other zany stuff. *The Goldfinch* checked in with some of the funniest folks around to get their joke forecasts. Some predict that you'll go stormy when you read the jokes we've selected. Others say you'll laugh yourself sunny. We predict miles of rainbow smiles.

Crack you up jokes

1. **What do you do if you don't like the weather in Iowa?**
   Wait a few minutes — it will change.

2. **How many Iowans does it take to change a light bulb?**
   One to screw it in and two to talk about the weather.

3. **What's a flood?**
   A river that's too big for its bridges.

4. **What do you have when there is no snow?**
   Tough sledding.

5. **What does a goldfinch get when it goes out in the rain?**
   Wet.

6. **Why does lightning shock people?**
   Because it doesn't know how to conduct itself.

7. **What is the worst kind of weather for rats and mice?**
   When it's raining cats and dogs.

Weather puzzler

Put this puzzler into your own words:

Moon and weather may change together, but a change in the moon does not change the weather.
Answer on page 30.
– provided by Dale Deskis

Story joke

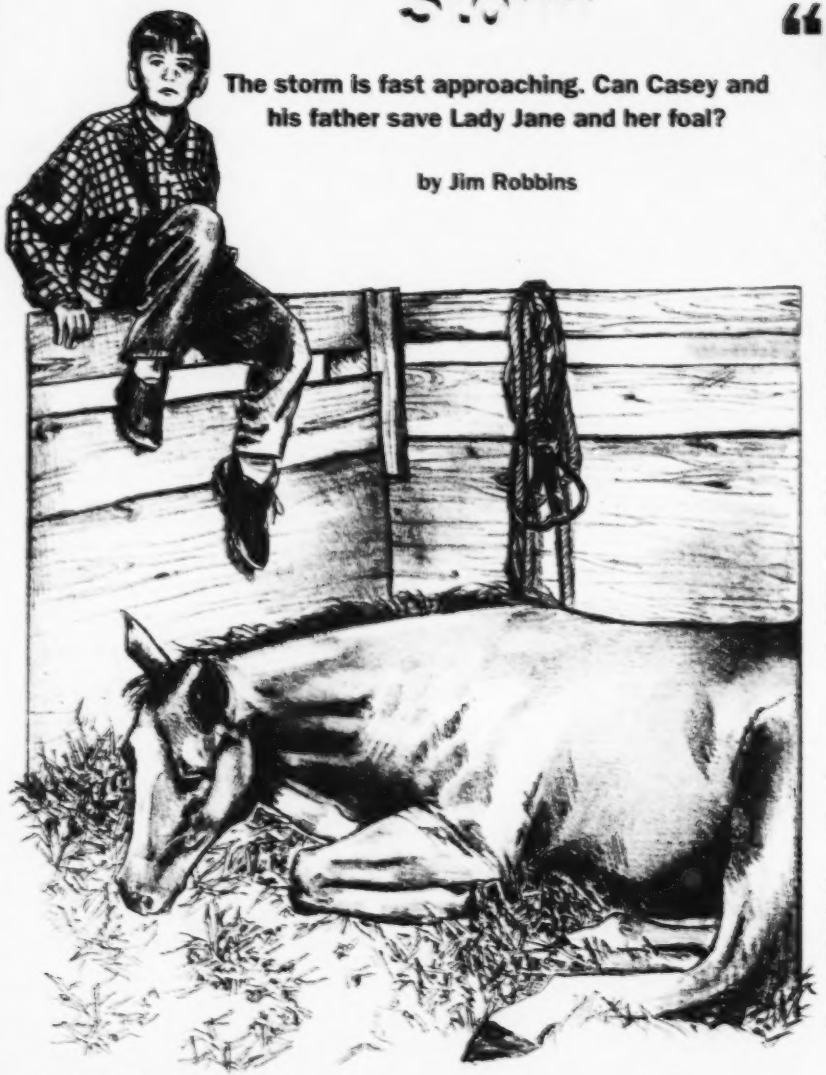
A group of Iowa schoolkids visit the Office of the State Climatologist in Johnston, Iowa, where they are shown the latest technology for forecasting weather. After the tour, one student asks the supervisor, "How do you predict a 75 percent chance of rain?" The supervisor responds, "It means there are four of us here, and three of us think it will rain."
– provided by Lin Ly

Tongue twister

Say this 10 times quickly:

Whether it is hot or whether it is cold, we will have weather, whether or not!
– provided by Dale Deskis

Storm



The storm is fast approaching. Can Casey and his father save Lady Jane and her foal?

by Jim Robbins

"Casey, get Doc Brown on the phone," Dad said. "Now."

Dad's voice was somber. I jumped down from my perch on the top rail of Lady Jane's stall and ran from the barn. Outside, the air was suffocating and the sky glowed green. It was unusually hot for this early in June. Black thunderclouds tumbled high overhead. Lightning split the sky in a brilliant flash.

"Quick! I need to get to the phone," I yelled as I ran through the kitchen. My little sister, Megan, nearly dropped the plate she was drying. Father's breakfast remained on the table, untouched.

"What's the matter, Casey?" Mom asked.

"It's Lady Jane. It's her time. The foal — Oh, Mother! We need Doc Brown!"

I stood on my tiptoes to reach the mouthpiece of the phone. Through the earpiece, I could hear voices on the party line.

"Please, may I use the line?" I interrupted. "It's an emergency!"

Soon the operator con-

Art by Mary Moye-Rowley

nected me with Doc Brown's office. Seconds became an eternity as I waited to hear his voice.

"Doc, this is Casey Richards. You've got to come out here. Lady Jane's about to foal. It's her first and she's having trouble . . ."

I listened, trying hard to focus on his instructions. In my mind, I repeated his words. Keep her calm. Make sure the foal isn't breech. Breech? Dad will know. When we see the front hooves, make sure the head is forward and between the front legs. Pull when you're sure of the head position. Don't pull until you're sure –

The line went dead.

Dust whirled around my boots with each step I took back toward the barn. Before I reached the side door, rain began to fall in the largest drops I'd ever seen. It was falling so hard, that when I turned around, I could no longer see our two-story house behind me. The sky was almost black.

"Doc Brown won't make it," I said to Dad, large tears rolling down my cheeks. "We got cut off!"

"There's no time for tears, Casey. We can do this. Together."

Dad stroked Lady Jane's neck as she lay panting in her stall. He spoke reassuring words. I'm not sure if he was talking to Lady Jane, or to himself.

"Good girl. You're doing fine. That little foal will be here in no time."

Just then Mom appeared beside Lady Jane. Her wet hair stuck to the sides of her face, framing frantic eyes.

"You two must come back to the house! The tornado! It's coming! Megan's in the cellar. We've got to get back there—"

Dad flipped on the barn radio. We'd been so worried about Lady Jane we'd forgotten to listen to the weather reports. "The National Weather Service has issued a tornado warning . . . tornado spotted on the ground . . . 25 miles southwest of Onawa . . . moving northeast at 20 miles per hour . . . Seek shelter immediately . . . basement or interior room . . . " The words were punctuated with static but the meaning was clear. Our 40-acre farm was in the path of a tornado.

Lady Jane's ears twitched nervously as we got her up and walked from her open stall to an enclosed room within the barn. Mom looked worried as she wished us luck and turned to go back to the house.

"Megan must be scared," I said, wishing I could be with her and Mom in the cellar, yet proud Dad thought I was old enough to stay and help. The truth is, I was terrified. I wondered if I'd ever see Mom and Megan again. Or if our house – the house I was born in twelve years ago – would still be standing when the storm was over. Our other horses were in the pasture. Would they survive? The cows were out, too. Dad had milked them before breakfast and Megan's cat, Scruffy, had greedily lapped up a cup of warm milk. Where was Scruffy? Could the chickens hold out against this wind? When Megan and I fed the chickens this morning, we argued about what we'd name Lady Jane's foal. She wanted to call it Sissy if it was a girl or Prancer if it was a boy. I called her a sissy for picking such stupid names. Now I wished I wouldn't have talked to her like that. We don't usually argue. She's practically my best friend,

even if she is my little sister.

Lady Jane pranced around the room where we kept the saddles, bridles, and blankets. She wasn't comfortable here. It was cramped and unfamiliar. But it was safer.

"Dad, I see the hooves!"

The foal was coming.

"Hang in there, Lady Jane," Dad said, trying to soothe her, but having to yell to be heard above the storm. We coaxed Lady Jane to the ground, where I'd spread out a bed of fresh straw. "I think all the walking helped move the foal into a better position!" Dad yelled to me. "Get me one of those saddle blankets!"

Dad wrapped the blanket around the tiny hooves to help him get a better grip. "Talk to Lady Jane," he commanded. "Try to keep her down. I'm going to help her along by pulling the next time she contracts."

Keep her calm, the vet's words echoed in my mind. Keep *me* calm, I thought.

"Doc said to make sure the head is forward . . . "

"I know," Dad shouted back. "If the head is turned, we could break its neck when we pull."

Dad seemed to know exactly what to do. I heard glass shatter outside the tack room. The entire barn shook. It sounded like a freight train was thundering through our barnyard. But there wasn't time to be scared.

"There it is! The nose — now, Lady Jane, NOW!" Dad exclaimed, pulling on the foal's forelegs with all his might.

"Dad," I whispered. "Dad, can you hear it? It's quiet outside."

I turned and saw Mom and Megan standing in the doorway. The winds were still. They cried because we were all right. I cried because I was so glad to see them. And Dad grinned as he stroked the soft head of Lady Jane's black foal. Centered between her large, searching eyes, was a jagged white mark like a lightning bolt.

Megan and I looked at each other and we knew we didn't need to look any further for a name. We said it together — "Storm."

Art by Mary Moye-Rowley

Michael Owen, 9, of West Liberty, records weather information at the Weather Watch station.

History makers

by Amy Ruth
photos by Jim Meisner

This summer, Iowa kids attended weather camps at the Putnam Museum of History and Natural Science in Davenport. *The Goldfinch* hung out with these campers – also called the mystifying meteorologists – to learn how weather works.

From high pressure to low pressure and wind speed to cloud direction, the mystifying meteorologists demystified the laws of weather.

"I like to see what the weather is going to be like," said Liz Dalton, 10, of Davenport. "It's important to know so that you don't go out into bad weather."

Weather stations

Each morning of the four-day weather camp, the campers visited the weather station in the nearby *Weather Wonders* exhibit. Here they studied weather instruments and looked for the following information: temperature, precipitation, wind speed and direction, the condition of the sky, and barometer and rain gauge readings. Back in the classroom, they carefully recorded this information in their log books and at the weather station board.

To learn about future weather conditions, the campers tuned in to their weather radio and listened for the local extended forecasts. Combining all this information gave the campers a good idea of the current weather condi-

Weather camp leader Mamta Israni and the mystifying meteorologists test their nephoscopes on the Putnam Museum grounds.

Brian Chiu, 9, of Bettendorf checks the sky for clouds while Liz Dalton, 10, of Davenport, demonstrates her barometer.

tions and what to expect later in the day and later in the week.

Experiments and instruments

Once they had prepared the day's forecast, the campers experimented with weather instruments to learn how to predict the weather without help from meteorologists.

Each camper made a barometer, an instrument that determines whether the air pressure in the atmosphere is high or low. Campers learned that different weather conditions appear with changes in air pressure. By reading their barometers, the campers could predict the weather. A high pressure reading means the weather will be fair to nice. A low pressure reading means you should expect cloudy and sometimes stormy weather.

The campers also studied clouds. They learned that different cloud formations mean different weather patterns. Whispy, boxy clouds called "cirrus stratus" bring a graying sky. "Cumulus," fluffy white clouds, bring fair weather. And "stratus," boxy, rectangular clouds, bring rain.

Armed with this information, the campers made nephoscopes (NEFF-oh-scopes).

"That's something to look at the sky with and it shows you the clouds and the cloud direction," said Andrew Huber, 10, of Davenport.

Using plexiglass and dark construction paper, the campers made this reflective instrument, then took it outside for a test run along with their barometers. They determined that the cumulus clouds were moving southeast and that the pressure outside was high. A perfect day for a picnic, kite flying, swimming, or roller blading.

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Answers

Wild Rosie's weather map (page 2)

Northwestern Iowa
Southeastern Iowa
Northeastern Iowa
Northeastern Iowa
Cooler; more northern location
Warmer; more southern location

Weather puzzler (page 24)

There is no cause and effect between the phases of the moon and the weather. The moon's ever-changing phases do not cause the weather to change.

Be a diary detective (page 19)

March 21: snow; May 9: rain; June 17: rain caused muddy roads.

Clothes, recreation, school, gardening, travel.

Rain (see entries for October 29, November 15, May 9, April 20, June 1, June 23).

It was showery on April 20; planting a garden is easiest when soil is moist.

A roof, crops, roads, a neighbor's barn, railroad tracks, area fences, bridges.

If she had recorded rainfall more precisely, Mary could have compared the rainfall with previous years and determined how much damage the rain actually caused.

Butchering livestock, sleighing, cutting ice, plowing, gardening, making mittens and other warm clothing.

Iowa weather online

Check out these online sites for more about Iowa's weather!

http://www.cnde.iastate.edu/weather.html

http://cirrus.sprl.umich.edu/wxnet/states/iowa.html

http://www.crhnwscr.noaa.gov/dvn/index.htm

http://www.ksu.edu/weather/stpia.html

The Roost

THIS IS METEOROLOGIST ROSIE REPORTING.
GOLDFINCH TV
WEATHER MAP
TODAY'S WEATHER IN IOWA WILL BE COLD AND SNOWY AND WINDY!
GOLDFINCH TV
WEATHER MAP
NOW WE TAKE YOU LIVE TO OUR ROVING REPORTER GOLDIE!!
TH-TH-TH-THANKS ROSIE. WH-WH-WH-WHAT EVER YOU DO, DON'T GO OUTSIDE!
IT MUST BE A HUNDRED DEGREES BELOW ZERO OUT HERE!
THE WIND MUST BE A THOUSAND MILES PER HOUR!
THE SNOW MUST BE A MILLION FEET DEEP!
B-B-B-BACK TO YOU, ROSIE!
HELP ME!
HEY, WITH GOLDIE, WHO NEEDS THE NATIONAL WEATHER SERVICE!
JERRY BROWN

SOCIAL STUDIES DEV CENTER
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